Case Study #4: Pollution Prevention at Medical Facilities in New Mexico, 2001

This case study number four presents general observations and pollution prevention opportunities for hospitals. The purpose of this document is to establish a framework for pollution prevention and waste management at all hospitals. Four different assessments were conducted at hospitals in New Mexico during 2001.

This document has been prepared as part of the City of Albuquerque's Pollution Prevention grant funded by **EPA** for Hospital Pollution Prevention, and is based on a report prepared by ***CGH Environmental Strategies, Inc***. of Burlington, Vermont, who served as project consultants.

Step One: Assess Current Situation and Goals

One of the first questions medical facilities must ask is "Who owns the waste system?" A **process owner should be identified** to oversee waste management and source control. Comprehensive waste management involves the oversight and coordination of multiple waste streams from many departments, staff education, collection schedules, vendor relationships, contracts, and regulatory compliance. Indicators or symptoms that ambiguity exists are overfull sharps containers, variation in container types and placement, absence of data, and uncharacterized hazardous wastes.

Most hospital departments generate wastes that are in more than one waste category. A process owner can ensure that wastes in all departments are being managed appropriately and that the myriad of regulatory requirements is met. The goal of a waste management program is to **manage wastes in the most environmentally and economically responsible** fashion, while ensuring regulatory compliance and worker safety are addressed.

Hospitals should accurately determine **waste generator status** by characterizing and counting wastes generated on site. All facilities should address hazardous wastes storage, spill readiness, and furnish materials and training for employees.

Step Two: Identify Pollution Prevention Opportunities

Biohazard Waste

- Review waste acceptance protocols from biomedical collection company.
- Review definition of 'trace' chemo acceptable for disposal in biohazard waste containers. Pharmacy and Oncology departments should ensure only TRACE chemo is being sent off as biomedical waste.
- Chemo spill kits should be available in the biohazard waste storage area. Facilities should have a spill prevention plan and protocol for the biohazard waste storage area.

Blood Spill Response kits throughout facility.

- NM medical waste regulations require absorbent material (pads preferably) in bottom of each waste container. Provide sorbent pads in packing room or utility areas where waste is aggregated to facilitate compliance with this requirement. Some facilities use **vermiculite**. Work with your vendor to determine if vermiculite has the absorbency properties needed to meet the

state standards. In addition, how much vermiculite is to be added to each container (96 gallon, 44 gallon, 17 gallon) size to meet the requirements?

Chemo waste containers without secondary packaging.

- Medical facilities should control who has access to Biomed Waste Storage Area.
- Employees should have vendor contact information and waste acceptance protocol available.
- Proper sizing of container for unit specific needs should be re-evaluated. Placement of wall mounted sharps container needs to be standardized
    - Proper height
    - No other waste containers beneath sharps containers
    - Quantify cost savings from using reusable sharps containers
        - Evaluate previous year's purchase of single use disposable sharps containers against current year's purchases.
- Review DOT requirements for staff involved in packaging, handling and signing manifests for biomedical wastes.

Sharps container in surgery. Container overfull & oversize instruments are sticking out.

- Check with vendor to find out if they offer extra services and products such as sorbent pads/material, a staging area for empty containers, etc. Hospitals may want to consider sharing information regarding vendors and compare rates.
- Does your medical facility have a disposal regimen that includes collection at source points for chemo wastes (pharmacy, oncology, and pediatrics) that exceed trace quantities?

Hazardous waste

Chemicals stored outdoors. Waste or new product? Spill clean up materials should be nearby.

- Inventory and review storage compatibility of materials. Are there unlabeled items on shelves? Define the purpose of the space. Are hazardous materials and hazardous wastes stored seperately? Who has access to hazardous materials and storage facilities?
- Check the EPA RCRA Online module on storage area and compare the requirements against your current storage facility. Very specific requirements exist for fire labeling, fire suppression, secondary containment, signage, training, access, setbacks from property line. See website **http://www.epa.gov/epaoswer/hotline/index.htm** for information on RCRA requirements.
- Reference JCAHO standards that address hazardous materials, hazardous wastes, and list the need for compliance with state, local and federal regulations regarding hazardous waste. MSDS sheets for all hazardous materials and non hazardous materials should be available to employees in an organized and centralized location, and available on units

- Facilities should have a plan for monthly tracking of incoming hazardous materials and hazardous wastes generated (department by department)
- Gravel is not optimal surface for storing potentially hazardous wastes. Clean up on gravel is extremely difficult and costly.
- Check other items stored in hazardous waste storage area for 'compatibility' issues
- Oil and other hazardous substances stored in drums should always be covered.

Outside storage area for oil & other items.

Universal Waste

- Consider a formalized used battery collection program. Containers for collection should be labeled **Used Batteries For Recycling**. Identify vendors that will recycle batteries and provide documentation. Disposing of batteries under the ***Universal Waste Rule*** will help reduce hazardous waste volumes and ensure all batteries are collected as a 'waste stream' and not disposed of in improper receptacles.
- Typically batteries should not be stored outdoors, because eof the possibility of spills and leaks of acid, etc. Collect and sort batteries by **chemistry type**. Collect batteries on unit level, store and sort in a designated secure area. Work with your hazardous waste vendor to determine optimal disposal for batteries that cannot be recycled.

Used batteries stored outdoors in totes. Drums of chemicals stored outside.

- Typically, chemicals should **not be** stored in overhead cabinet, because of the possibility of spilling chemicals or dropping chemicals when reaching overhead. Chemicals stored in cabinets should have secondary containment, hazard labeling (NFPA), and MSDS sheet available for employees.
- Check procurement contract to see if vendor will accept used lamps as part of the current contract.
- Engage facilities management staff responsible for changing light bulbs in program and collection
- Be sure to track how many spent fluorescent lamps are recycled, so that you are sure what is coming in, as new product is also recycled. Also, check to see if U-bulbs from view boxes are being recovered for recycling. Verify with vendor that lamps are recycled as Universal waste and not disposed of as hazardous waste.

Recyclable waste

Forty-percent or more of hospital waste is potentially recyclable! There are many options:

- Consider collecting unused wooden pallets. Some facilities collect and sell them for reuse.
- Identify vendor to recycle plastic tubes.

- Recycle cardboard to reduce solid waste pickups. If employees are required to operate a baler. Check to be sure proper *lock out/tag out* program is in place for the baler, and that staff has formal documented training in baler use. Corrugated cardboard can have market value. Explore options with local vendors.
  - Check to make sure that pallets and boxes used for delivery are managed properly as soon as possible. This will allow facilities to avoid:
    - Possible fire code violations
    - Air quality and cleaning issues associated with unpacking cardboard throughout the facility; excessive wear and ton wallpaper, edge moldings, floor from cardboard, pallets and pallet movers
    - Excessive labor needed to uncrate on the units then collect and remove cardboard waste through facility for disposal.
    - Large percentage of cardboard wastes being discarded as trash versus recycled
  - Options:
    - Uncrate supplies and deliver to floors in reusable plastic totes on rolling carts to keep cardboard waste off units
      - This option will free up housekeeping staff time, but will require additional time on the part of distribution staff.
    - Request suppliers to deliver product in reusable totes.
- Make sure that the container used to collect cardboard is conveniently accessible. Consider placing a large wheeled cart on the loading dock for staff to place cardboard waste in when they are dumping other garbage. Then, the cart can be wheeled to the dumpster for loading with cardboard. Other more efficient ways for collecting cardboard include installing a second compactor adjacent to the trash compactor and using it to collect cardboard.
- Consider renting/leasing/purchasing a baler to bundle the cardboard. A two hundred thirty-five-bed hospital can expect to generate approximately two tons of cardboard per week.
- Medical facilities should make sure collection containers are uniform in appearance, and that they can't be confused with other collection containers, i.e., waste paper collection bins are yellow and hazardous waste containers are yellow.
- Explore diverting other materials for recycling i.e., steel cans in kitchens, scrap metal, construction and demo wastes. Steel cans from kitchen, aerosol cans, etc, may be allowable as part of scrap metal collection. Check with your vendor
- Dialysis and food services generate hundreds of 1-gallon containers each week. Diverting the jugs from the trash compactor into a recycling waste stream could result in having fewer 'pulls' for trash to the landfill

Mercury Pollution Prevention

Inventory and phase-out use of mercury containing healthcare products and devices

- Sphygmomanometers
- Thermometers
- Esophageal dilators from endoscopy

- Check thermostats and switches to ensure that mercury-containing equipment is retired.
- Check the list of chemicals used by laboratory (outsourced vendor) for mercury containing chemicals and substitute with other chemicals.
- Monitor purchases to keep mercury OUT of the organization.
- Conduct a periodic review of gift shop for mercury containing consumer goods.
- Plan on conducting a facility-wide drain trap clean out to purge any fugitive mercury from years past when mercury products were commonly used.
- Check cleaning supplies to ensure that they do not contain mercury.

Special Care Unit: Literature for parents of newborns on Non-Mercury thermometers. Example of **community pollution prevention**

Laboratory Pollution Prevention

- Check the City of Albuquerque's **Best Management Code of Practice for Biomedical Laboratori*es*** for best management practices concerning waste formaldehyde solutions. The **Best Management Code of Practice for Biomedical Laboratories** can be downloaded from the p2 Program's web page at http://www.cabq.gov/p2**, or contact the p2 Program at 873-7058/7059 for a free copy!**
- Minimize use of hazardous chemicals such as Bouins solution. Picric acid is used in fixatives such as Bouin's fixative. Picric acid is explosive when dry, shocked, heated, or comes in contact with metals or metallic salts. It is toxic by skin absorption and its use should be avoided as much as possible. See the **Best Management Code of Practice for Biomedical Laboratories** for more information concerning substitutes, etc.
  - Eliminate mercury-containing fixatives.
  - Use secondary containment in chemical storage cabinets to prevent unintentional spills or releases.
  - Review floor drains in lab areas. Have drain covers (i.e., magnetic pads) available to seal off any direct drains to sewer system in case of a large spill.
  - Check with treatment plant about pouring ignitable waste down the drain. Most treatment plants prohibit flammables from being disposed of in the sanitary sewer system.

Hazardous Pharmaceuticals

Many cytotoxic agents fall under the RCRA characteristic wastes (generators are obligated to 'characterize' their waste before disposing of it -- nearly all chemo meds are toxic, some are corrosive/irritant) and should be disposed of accordingly. Review vendor's waste acceptance protocol for chemotherapy wastes.

- Research the potential for using reverse distribution firm to divert expired and unused pharmaceuticals from landfills, wastewater & incinerators. Make sure reverse distribution company has the capability to destroy hazardous pharmaceuticals i.e., epinephrine, warfarin, nitroglycerine
- Avoid drain disposal and red bag disposal of RCRA listed hazardous pharmaceuticals.

- Contaminated Personal Protective Equipment (PPE) can be disposed of as solid waste

Facilities Management

Do not store open containers of unlabeled chemical in open areas.

- Minimize use of solvents, paint thinners, oil based paints
- Inspect Facilities Material storage area to ensure that it is properly set up for storage of waste oils, fuels, and boiler chemicals.
- Develop inventory of hazardous chemicals in use; seek substitutions where possible.
- Purge hazardous chemicals no longer in use.

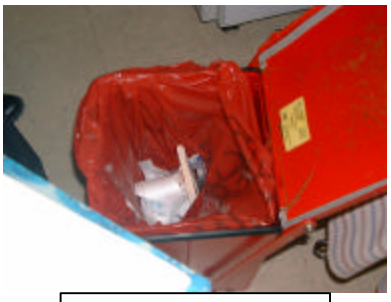
Purchasing

Some purchasing agents offer delivery of many healthcare products in reusable totes. Visit **Hospitals for A Healthy Environment - Environmentally Preferable Purchasing Site** at http://geocities.com/EPP_how_to_guide/

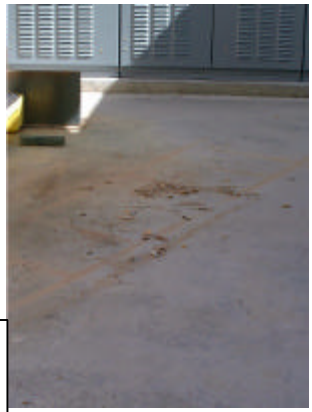
Delivery of product in reusable totes versus cardboard boxes.

More Pollution Prevention Opportunities:

Track positive efforts such as toner cartridge recycling, kitchen grease recycling, durable goods reuse and recycling. Develop a training program on waste management for new employees to optimize participation in waste programs.



Red bag waste container in Surgery. Contents are trash i.e., foam drinking cup & packaging.



Cigarette butts on ground next to chemical & used battery storage.

Endoscopy: Non-mercury containing esophageal dilators.

Non-mercury thermometers in hospital gift shop.

The City's p2 Program can help Albuquerque hospitals conduct waste audits. Contact the p2 Program at 873-7058/7059 for more information.